

# The Quotient Rule

## Basic Properties and Formulas

If  $f(x)$  and  $g(x)$  are differentiable functions (the derivative exists),  $c$  and  $n$  are any real numbers,

1.  $\frac{d}{dx}(c) = 0$

2.  $(cf(x))' = cf'(x)$

3.  $\frac{d}{dx}(x^n) = nx^{n-1}$  – **Power Rule**

4.  $(f(x) \pm g(x))' = f'(x) \pm g'(x)$

5.  $(f(x)g(x))' = f'(x)g(x) + f(x)g'(x)$  **Product Rule**

6.  $\left(\frac{f(x)}{g(x)}\right)' = \frac{f'(x)g(x) - f(x)g'(x)}{(g(x))^2}$  **Quotient Rule**

7.  $\frac{d}{dx}(f(g(x))) = f'(g(x))g'(x)$  – **Chain Rule**